Evolution of Photoionized Regions

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Abstract. Material in the vicinity of hot stars will be strongly affected by the high density of ultraviolet radiation. In particular, molecules, if present, will be ionized and — depending on the intensity of UV radiation — dissociated, atoms can be ionized, dust grains will be positively charged, and the medium in general will be heated. The resulting pressure gradients drive large scale motions of the gas. Because of (a) variations in the UV flux from the hot stars due to evolutionary effects, (b) the inhomogeneous distribution of material, and (c) interactions with flows resulting from stellar winds, jets, and perhaps infall, such photoionized regions can exhibit a complex behavior.

We shall discuss in general the modeling of the evolution of photoionized regions: What are the relevant processes and how well do we understand them? Specific examples of current evolutionary models and how they compare to observed photoionized regions will be discussed.

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